| New Claims | Support in Specification |
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| **39.** An ordered **array** of **immobilized nucleic acid sequences attached to a solid support** | The present invention contemplates an **array of nucleic acid sequences**, comprising a solid support having at least one surface; and a plurality of **nucleic acid sequences attached to** said surface of said **solid support**, wherein each said nucleic acid **sequence is attached** to said surface on different physical areas of said surface… [page 12, lines 23-26] |
| comprising a **plurality** of **identical oligonucleotide sequences attached** to the **solid support,** | The present invention contemplates a method of generating an array, comprising providing a **solid support comprising a plurality of positions for oligonucleotides**, the positions defined by x and y coordinates; a **plurality of identical oligonucleotides**, each oligonucleotide comprising a sequence; and a plurality of unique circular DNA templates, each circular DNA template **comprising a sequence of interest and a region complementary to at least a portion of the sequence of the oligonucleotides**, the sequence of interest being different for each circular template; **immobilizing one oligonucleotide** from the plurality of identical oligonucleotides in each of the positions **on** the **solid support** to create an **ordered array comprising a plurality of identical immobilized oligonucleotides**; adding to each immobilized oligonucleotide of the ordered array a circular DNA template from the **plurality of the unique circular DNA templates** under conditions such that the immobilized oligonucleotide hybridizes to the circular DNA template… [page 19, lines 9-21] |
| wherein each of the identical **oligonucleotide** sequences is **followed by at least two copies of a sequence** that is | to **create a plurality of primed circular templates, each primed circular template comprising a different sequence of interest;** and **extending each of the primed circular templates to create an extended immobilized oligonucleotide comprising at least two copies** |

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| **complementary to a sequence of interest** and<br><br>wherein the sequence that is complementary to a sequence of interest is **different for each** of the immobilized **nucleic acid** sequence, and<br><br>wherein each of the at least two copies of a sequence that is complementary to a sequence of interest is **separated by** a **nucleic acid region** that is **at least partially complementary** the **sequence of** the plurality of **identical oligonucleotide sequences**. | **of the sequence of interest**, thereby generating an ordered redundant array. [page 19, lines 21-25]<br><br>**...to create a plurality of primed circular templates, each primed circular template comprising a different sequence of interest;** and **extending each of the primed circular templates to create an extended immobilized oligonucleotide comprising at least two copies of the sequence of interest**, thereby generating an ordered redundant array. [page 19, lines 21-25]<br>The invention contemplates that such **regions that separate each copy of the sequence of interest can** be additional regions that can **hybridize to the generic immobilized oligonucleotide** (e.g. the WWWW of FIG. 1A could be replaced with yet another region defined by AAAACC). [page 11, lines 15-18] |
| **40.** The ordered array of claim 39, wherein **each sequence of interest corresponds to a unique portion of a target sequence**. | The **sequence of interest may comprise a portion of the sequence of a target of interest** (e.g., cancer gene, histocompatibility gene, etc.). To create an array with diverse sequences, a circular DNA template is added at each position (e.g., by a robot), wherein **each circular DNA template added has a unique sequence of interest** (e.g., a different sequence corresponding to a unique portion of a target). [page 11, lines 23-28] |
| **41.** The ordered array of claim 39, wherein | One important drawback to current approaches for such arrays is the inconvenience of |

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| the **unique portion of the target sequence is more than 20 nucleotides long**. | chemically synthesizing each distinct oligonucleotide necessary to represent (collectively) the entire target sequence, particularly if such oligos are long (e.g., **greater than twenty nucleotides**). Moreover, since space on the solid support is limited--and yet large numbers of such oligonucleotides are needed--there is little room for redundancy, i.e., an array containing two identical nucleotide sequences. [page 10, lines 3-8]<br><br>The **present invention contemplates solving both problems** by utilizing circular nucleic acid in the production of the array. The method contemplates a solid support with positions for oligonucleotides defined by x and y coordinates. [page 10, lines 9-11] |
| **42.** The ordered array of claim 39, wherein the **nucleic acid region that is at least partially complementary to the sequence of the plurality of identical oligonucleotide sequences is longer than 6 nucleotides**. | The region having a sequence complementary to at least a portion of said generic oligonucleotide permits hybridization of the circular template to the immobilized oligonucleotide (FIG. 1A is merely illustrative and is not meant to limit the sequence or length of the sequence of this hybridizing region; indeed, **regions larger than six nucleotides are preferred**). [page 10, lines 19-23] |
| **43.** The ordered array of claim 39, wherein each immobilized nucleic acid sequence comprises at **three or more copies** of said sequence that is complementary to a sequence of interest. | Each circular DNA template is added under conditions such that the circular DNA template hybridizes with the generic immobilized oligonucleotide, said immobilized oligonucleotide thereafter being extended by a polymerase to create a unique extended nucleic acid strand at each position on the solid support, such extended strands comprising two or more (and more typically **three or more**, and more preferably, ten or more, and still more preferably more than fifty) copies of the sequence of interest. [page 10, lines 28-29, page 11, lines 1-5] |

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| **44.** The ordered array of claim 39, wherein each immobilized nucleic acid sequence comprises **ten or more copies** of said sequence that is complementary to a sequence of interest. | Each circular DNA template is added under conditions such that the circular DNA template hybridizes with the generic immobilized oligonucleotide, said immobilized oligonucleotide thereafter being extended by a polymerase to create a unique extended nucleic acid strand at each position on the solid support, such extended strands comprising two or more (and more typically three or more, and morc preferably, **ten or more**, and still more preferably more than fifty) copies of the sequence of interest. [page 10, lines 28-29, page 11, lines 1-5] |
| **45.** The ordered array of claim 39, wherein each immobilized nucleic acid sequence comprises **more than fifty copies** of said sequence that is complementary to a sequence of interest. | Each circular DNA template is added under conditions such that the circular DNA template hybridizes with the generic immobilized oligonucleotide, said immobilized oligonucleotide thereafter being extended by a polymerase to create a unique extended nucleic acid strand at each position on the solid support, such extended strands comprising two or more (and more typically three or more, and morc preferably, ten or more, and still more preferably **more than fifty**) copies of the sequence of interest. [page 10, lines 28-29, page 11, lines 1-5] |
| **46.** An ordered array of **immobilized nucleic acid sequences attached to** a **solid surface** comprising a plurality of nucleic acid sequences attached to the solid surface, | In another embodiment of the present invention, a method of generating an **array** capable of hybridizing to fragments of a target nucleic acid is contemplated, **comprising** providing a **solid support** comprising positions for oligonucleotides, the positions defined by x and y coordinates; a plurality of oligonucleotides, each oligonucleotide comprising a sequence complementary to a different portion of the sequence of the target nucleic acid; and a plurality of corresponding circular DNA templates, each circular DNA template comprising a different portion of the sequence of the target; **immobilizing** each of the **oligonucleotides** in one of the positions **on** the **solid support** to create an ordered array comprising a plurality of immobilized oligonucleotides; [page 20, lines 20-29] |

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| wherein **each** of the **attached nucleic acid sequence is different** and **comprises** at **least two copies of a sequence** that is complementary to a **sequence of interest**, | In another embodiment of the present invention, **an ordered redundant array of immobilized oligonucleotides produced according to the above method is contemplated**. [page 21, lines 20-22]<br><br>adding to each immobilized oligonucleotide of the ordered array a corresponding circular DNA template under conditions such that the immobilized oligonucleotide hybridizes to the corresponding circular DNA template to create a plurality of primed circular templates; and extending the primed circular templates to create an **ordered redundant array** of **extended immobilized oligonucleotides**, each extended immobilized oligonucleotide **comprising at least two copies** of the portion **of the sequence of the target nucleic acid**. [page 20, lines 29-30, page 21, lines 1-5]<br><br>In this case, **each immobilized oligonucleotide comprises** a region comprising a **different sequence** (FIG. 1B is merely illustrative, showing one such oligonucleotide with one such unique sequence), **each different sequence** being **complementary to** a **sequence of interest** on a circular template…Because **each immobilized oligonucleotide is unique**, the region having a sequence complementary to at least a portion of the circular template permits hybridization only to the "corresponding" circular template; thus, the **region permitting hybridization on the circular template is also the sequence of interest…** [page 11, lines 20-29]<br><br>Each circular DNA template is added under conditions such that the circular DNA template |

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| wherein the **sequence** that is **complementary to** the **sequence of interest** is **more than 13 nucleotides long**. | hybridizes and thereafter the **oligonucleotide** is **extended** by a polymerase **to create a unique extended nucleic acid strand** at each position on the solid support, such extended strands **comprising two or more** (and more typically three or more, and more preferably, ten or more, and still more preferably more than fifty) **copies of the sequence of interest**. [page 12, lines 2-7]<br><br>(FIG. 1B is merely illustrative and is not meant to limit the sequence or length of the sequence of this hybridizing region; indeed, **regions larger than thirteen nucleotides are preferred**). [page 11, line 30, page 12, lines 1-2] |
| **47.** The ordered array of claim 46, wherein each immobilized nucleic acid sequence comprises **three or more** copies of said sequence that is complementary to a sequence of interest. | Each circular DNA template is added under conditions such that the circular DNA template hybridizes and thereafter the oligonucleotide is extended by a polymerase to create a unique extended nucleic acid strand at each position on the solid support, such extended strands comprising two or more (and more typically **three or more**, and more preferably, ten or more, and still more preferably more than fifty) copies of the sequence of interest. Thereby, an array is created with redundancy in the z dimension (i.e., out of the x and y plane of the solid support). [page 12, lines 2-8] |
| **48.** The ordered array of claim 46, wherein each immobilized nucleic acid sequence comprises **ten or more** copies of said | Each circular DNA template is added under conditions such that the circular DNA template hybridizes and thereafter the oligonucleotide is extended by a polymerase to create a unique extended nucleic acid strand at each position on the solid support, such extended strands |

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| sequence that is complementary to a sequence of interest. | comprising two or more (and more typically three or more, and more preferably, **ten or more**, and still more preferably more than fifty) copies of the sequence of interest. Thereby, an array is created with redundancy in the z dimension (i.e., out of the x and y plane of the solid support). [page 12, lines 2-8] |
| **49.** The ordered array of claim 46, wherein each immobilized nucleic acid sequence comprises **more than fifty** copies of said sequence that is complementary to a sequence of interest. | Each circular DNA template is added under conditions such that the circular DNA template hybridizes and thereafter the oligonucleotide is extended by a polymerase to create a unique extended nucleic acid strand at each position on the solid support, such extended strands comprising two or more (and more typically three or more, and more preferably, ten or more, and still more preferably **more than fifty**) copies of the sequence of interest. Thereby, an array is created with redundancy in the z dimension (i.e., out of the x and y plane of the solid support). [page 12, lines 2-8] |
| **50.** An ordered **array** of **immobilized nucleic acids** comprising a **solid surface**, a plurality of **first oligonucleotides** attached to said solid surface, | Another embodiment of the present invention is to provide **nucleic acid arrays** that are produced by a process **comprising** the steps of providing circular single-stranded nucleic acid templates having a sequence, and **immobilized linear partially single-stranded nucleic acid oligonucleotide primers** having a sequence complementary to at least a portion of said sequence of said circular single-stranded nucleic acid templates, and mixing said circular single-stranded nucleic acid templates with said partially single-stranded nucleic acid oligonucleotide primers to create a mixture under conditions such that at least a portion of said circular single-stranded nucleic acid templates hybridize to said partially single-stranded oligonucleotide primers, and treating said mixture under conditions such that said immobilized linear partially single-stranded nucleic acid primers are extended. [page 13, lines 3-13] |

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| and a **second nucleic acid** at least **partially hybridized to** each of said **first oligonucleotides**, wherein the **second nucleic acid comprises** a **region** that is at least **partially complementary** to the **first oligonucleotide** and two or more repeats of a sequence of interest. | For example, upon primer sequence attachment to a solid surface, a **second primer sequence** may be **hybridized to the first primer**, followed by the addition of circular or semi-circular template sequences to be hybridized to the second primer sequence. [page 13, lines 20-23] Another embodiment of the present invention is to provide **nucleic acid arrays** that are produced by a process comprising the steps of providing circular single-stranded nucleic acid templates having a sequence, and immobilized linear partially single-stranded nucleic acid oligonucleotide **primers having a sequence complementary to at least a portion of** said sequence of said circular **single-stranded nucleic acid templates**, and mixing said circular single-stranded nucleic acid templates with said partially single-stranded nucleic acid oligonucleotide primers to create a mixture under conditions such that at least a portion of said circular single-stranded nucleic acid templates hybridize to said partially single-stranded oligonucleotide primers, and treating said mixture under conditions such that said immobilized linear partially single-stranded nucleic acid primers are extended. [page 13, lines 3-13] |
| 51. The ordered array of claim 50, wherein the two or more copies of the sequence of interest are separated by a nucleic acid **sequence forming a separating region between each sequence of interest**. | Such larger templates may (or may not) contain other regions such as regions that separate each copy of the sequence of interest (such a separating region is depicted in FIG. 1A as WWWW, the number of nucleotides "W" being variable between 0 and 100). The invention contemplates that such regions that separate each copy of the sequence of interest can be additional regions that can hybridize to the generic immobilized oligonucleotide (e.g. the WWWW of FIG. 1A could be replaced with yet another region defined by AAAACC). [page 11, lines 12-18] |
| 52. The ordered array of claim 50, wherein the plurality of first oligonucleotides are | The present invention contemplates an array of nucleic acid sequences, comprising a solid support having at least one surface; and a **plurality of nucleic acid sequences attached to said** |

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| identical. | **surface of said solid support**, wherein each said nucleic acid sequence is attached to said surface on different physical areas of said surface, and **each nucleic acid sequence may contain sequentially identical** or different deoxyribonucleotide or ribonucleotide bases. It is not intended that the present invention be limited to identical nucleic acid sequence within the arrays. [page 12, lines 23-29] |
| 53. The ordered array of claim 50, wherein the plurality of first oligonucleotides are different. | The present invention contemplates an array of nucleic acid sequences, comprising a solid support having at least one surface; and a **plurality of nucleic acid sequences attached to said surface of said solid support**, wherein each said nucleic acid sequence is attached to said surface on different physical areas of said surface, and **each nucleic acid sequence may contain sequentially** identical or **different** deoxyribonucleotide or ribonucleotide bases. It is not intended that the present invention be limited to identical nucleic acid sequence within the arrays. [page 12, lines 23-29] |
| 54. The ordered array of claim 50, wherein each second nucleic acid comprises three or more copies of said sequence of interest. | See, support for claims 43-45 and 47-49, *supra.* |
| 55. The ordered array of claim 50, wherein each second nucleic acid comprises ten or more copies of said sequence of interest. | See, support for claims 43-45 and 47-49, *supra.* |
| 56. The ordered array of claim 50, wherein each second nucleic acid comprises more than fifty copies of said sequence of | See, support for claims 43-45 and 47-49, *supra.* |

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| interest. | |